

STUDIES IN THE GENUS *COCCOLOBA*, VI.
THE SPECIES FROM THE LESSER ANTILLES,
TRINIDAD AND TOBAGO *

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THE PRESENT STUDY continues a series of papers on the genus *Coccoloba* as it occurs in the West Indies. A single study of the genus as a whole has been considered impossible for a number of reasons. Not only is the genus a large one, but reliable data based on field observations, particularly in relation to hybridity and possible apomixis, have been lacking. In addition, the application of many names is difficult, for too many species, including some only recently described, have been based on anomalous specimens (adventitious shoots, for example). Many names either have been misapplied or have passed unnoticed and many species are represented only by the type collection. A further difficulty is the lack of strong and easily defined characteristics which can be used in dividing the genus taxonomically. Some of these obstacles have been overcome in part, as has been pointed out in earlier papers of this series. However, other difficulties, such as our inadequate knowledge of the range of variation in these plants, still remain and much more field work will be needed.

The artificial geographical division which was the basis for my previous studies of the genus as it occurs in Cuba, Jamaica, Puerto Rico and the Bahamas, Hispaniola, and now the Lesser Antilles and Trinidad, has allowed progressive steps which will be the foundation for further work on the genus in South America, Central America and Mexico.

In 1950 I completed a field study of *Coccoloba* in the Lesser Antilles, Trinidad and Tobago which supplied much of the material and information used in this paper. I am grateful to the directors of the American Philosophical Society and the directors of the Milton Fund of Harvard University for grants which made the field work possible. Specimens used in this study have been borrowed from a number of herbaria and botanical institutions represented by the standard abbreviations given. I wish to express my grateful appreciation to the directors and the curators of these institutions for the use of these specimens.

The same difficulties encountered in earlier work apply to this study. Although field work in the Caribbean area has resolved many problems, many others remain and further studies will be necessary for a complete understanding of many of the species. The variation in leaf-form and -size when correlated with the growth habit of any particular plant should be incorporated into a general description of the species. In doing so, the

*The preceding papers in this series will be found in Jour. Arnold Arb. **30**: 388-424. 1949; **37**: 317-339. 1956; **38**: 81-106. 1957; **38**: 211-242. 1957; **39**: 1-48. 1958.

construction of a key to species to cover all variations seen in the field and represented in the herbarium collections becomes more difficult. In some species only one sex is known; in some, the fruiting material is unknown or is inaccurately associated with the flowering material.

Fortunately, I have been able to see the type material of all of the more recently described species and all but a few of the older species. Many of Lindau's species from Trinidad were based on specimens in the herbarium of the Imperial College of Tropical Agriculture, Port of Spain, Trinidad. Fragments of these specimens were placed by Lindau in the herbarium of Krug and Urban in the Botanisches Museum in Berlin. The fragments remain in Berlin, but the more complete material in Trinidad has largely been destroyed by the tropical environment and by periods of neglect.

The geographic area considered in this paper is currently regarded as an unnatural one. The Lesser Antilles (the Leeward and Windward Islands from Antigua to Grenada) form a group of relatively young islands, mostly volcanic in origin. The natural vegetation of this area is presumed to have been derived by migrations southward from the Greater Antilles, by migrations northward from Trinidad and South America and by the *in situ* development of some endemic or localized species. Trinidad and Tobago, in contrast, appear floristically as well as geologically as a part of the South American mainland. Of the seventeen taxa considered in this paper, two (*Coccoloba uvifera* and *C. venosa*) are widespread, appearing along the seacoasts of the Antilles, Central America and South America. Four species and one form, *C. diversifolia*, *C. krugii*, *C. pubescens*, *C. swartzii* and *C. swartzii* f. *pubescens*, are found in the Greater Antilles and extend to varying degrees into the Lesser Antillean islands. Only one taxon, *C. × boxii*, representative of a hybrid population, occurs only in the Lesser Antilles. *Coccoloba dussii* occurs only in the Lesser Antilles and Trinidad, but is very similar to a species from South America. *Coccoloba ascendens* and *C. novogranatensis* occur in the Lesser Antilles and Trinidad and in South America, with the range of *C. novogranatensis* extending west and then north through Central America, while the range of *C. ascendens* continues south and east in Brazil. Five species (*C. cruegeri*, *C. fallax*, *C. latifolia*, *C. nitida* and *C. striata*) occur in Trinidad and South America but have not been found in the Lesser Antilles. One species, *C. nigrescens*, is currently known only from the Bocas Islands near Trinidad, but additional material will probably reveal its relationship or identity with other southern species.

Thus, in contrast to the Greater Antilles where the genus *Coccoloba* has evolved a great many endemic species, neither Trinidad nor the Lesser Antilles has experienced a parallel elaboration of the genus. The Lesser Antillean species of *Coccoloba* are predominantly Greater Antillean species which have migrated southward. The species found in Trinidad are basically South American and only a few species have migrated northward into the Lesser Antilles.

Following the key, the species are described and are listed in alphabetical order.

KEY TO THE SPECIES

- A. Inflorescence paniculate, stems thick, striate-angled, hollow; leaves umbonate between the conspicuously reticulate veins. *C. latifolia*.
- AA. Inflorescence racemose, solitary or fascicled.
- B. Inflorescence generally fasciculate; ocreae large and flaring, conspicuously striate. *C. fallax*.
- BB. Inflorescence solitary, rarely with a smaller one at the base.
- C. Lianas or woody plants with scrambling branches.
- D. Branches scandent or entire plant with flattened stems through bilateral cambial activity; flowers and fruit on pedicels longer than ocreolae. *C. dussii*.
- DD. Branches uniformly thickened; pedicels scarcely, if at all, exceeding ocreolae in flower; fruit on conspicuous pedicels.
- E. Leaves of normal shoots usually oblong-elliptic, coriaceous, shining when dry, flat, coarsely and conspicuously reticulate veined, the apex rounded to emarginate; fruit large, 1.8–2 cm. long, 1–1.2 cm. thick; fruiting hypanthium rugose when dry, thick and brittle. *C. ascendens*.
- EE. Leaves of normal shoots not oblong-elliptic, thinner in texture, usually acute or acuminate at the apex; fruit smaller; hypanthium thin and vascular.
- F. Leaves ovate, chartaceous, flat, the apex acuminate, the ultimate venation finely reticulate; stems hollow; inflorescence slender. *C. striata*.
- FF. Leaves ovate to obovate-oblong on normal branches, the blades usually umbonate between the veins, the apex acute; branches solid; inflorescence stout. *C. nitida*.
- CC. Trees or shrubs, branches not noticeably scandent.
- G. Pedicels conspicuously longer than the ocreolae in flower and fruit.
- H. Leaves basically orbicular, as broad as or broader than long, one or both basal lobes overlapping the petiole.
- I. Leaves conspicuously rugose and pubescent; fruit globose or ovoid, 0.5–0.6 cm. long. *C. pubescens*.
- II. Leaves conspicuously fleshy, not rugose, glabrate; fruit obpyriform, 1.2–2 cm. long. *C. uvifera*.
- HH. Leaves basically ovate to elliptic, longer than broad, narrowed or rounded at the base. *C. diversifolia*.
- GG. Pedicels shorter than or scarcely exceeding the ocreolae in flower and generally in fruit.
- J. Plants deciduous; ocreae membranaceous, translucent and usually deciduous for all of its length (Trinidad species).
- K. Leaves of normal shoots usually broadest above the middle, narrowed toward the base, the midrib not sharply keeled below, the blades turning black on drying. *C. nigrescens*.
- KK. Leaves of normal shoots usually broadest below the middle, round to cordate at the base, the midrib sharply keeled, the blades at most darkening slightly on drying. *C. cruegeri*.
- JJ. Plants not noticeably deciduous; ocreae not membranaceous, the base at least coriaceous and persisting.

- L. Achene surrounded by the perianth lobes, the ocreolar sheath commonly elongating with the pedicels, the bracts usually black. *C. venosa*.
- LL. Achene surrounded by the hypanthium, the perianth lobes appressed and imbricate or coronate on the achene, the bracts not conspicuously dark in color.
- M. Perianth lobes appressed and imbricate in fruit, the fruit triangular in cross section; leaves ovate to sub-orbicular, 2–5 cm. long, cordate at the base. *C. krugii*.
- MM. Perianth lobes coronate in fruit (fruit not known for *C. × boxii*), the fruit round in section; leaves larger.
- N. Leaves cordiform-ovate, broadest below the middle, 11 × 6.5 to 27 × 17.5 cm. long and broad, the base obliquely auriculate-cordate or rounded and evenly cordate. *C. × boxii*.
- NN. Leaves ovate to ovate-elliptic, smaller, generally narrowed below the middle.
- O. Petioles arising above the base of the ocreae, the base of the blade auriculate at the junction with the petiole, the ultimate venation not conspicuous. *C. novogranatensis*.
- OO. Petioles arising from the base of the ocreae, the base of the blade slightly decurrent on the petiole, the ultimate venation reticulate and slightly elevated. *C. swartzii*.

Coccoloba ascendens Duss ex Lindau, Engl. Bot. Jahrb. 13: 156. 1890.

Coccoloba ascendens Duss mss. in herb. Krug & Urban; Ann. Inst. Col. Marseille 3: 168. 1897, in part.

Coccolobis quadrifida Britton, Bull. Torrey Bot. Club 53: 467. 1926.

Coccoloba urbaniana Lindau, Engl. Bot. Jahrb. 13: 155. 1890 (as to Trinidad specimens cited but not description).

Climbing shrub or liana, much branched, the branches to 50 feet long, glabrous, occasionally hollow; ocreae membranaceous, deciduous, cut to the base, 17–20 mm. long, acuminate at the apex, glabrous to lightly puberulent; petiole inserted below the ocrea, stout to slender, 1–2.5 cm. long, flattened adaxially with a narrow compressed groove, glabrous; leaf blades elliptic, obovate, oblong, rarely ovate, 11 × 6, 13 × 8 to 17 × 14.5 cm. long and broad, coriaceous, glabrous on both surfaces, the apex rounded, acute or emarginate, the base rounded to cordate, the midrib and primary veins prominent below, distinct but not prominent above, the primary veins 5–7 pairs, arcuate anastomosing near the margin, the ultimate venation reticulate and conspicuous on both surfaces; juvenile leaves of the current year's lateral shoots elliptic-lanceolate, 14 × 7 to 20 × 8.5 cm. long and broad, the apex acute to acuminate, the base acute; leaves of adventitious shoots on petioles 3–5 cm. long, the blades ovate to elliptic-ovate, 30 × 20 to 45 × 30 cm. long and broad, the apex acute, the base rounded to slightly cordate; inflorescence axillary or terminal, 13–17 cm. long, the basal ocrea

1 cm. long, densely ferruginous puberulent, the rachis puberulent, the bracts broadly ovate, 2 mm. long and broad; ocreolae 2 mm. long, shallowly lobed; flowering pedicels to 2 mm. long; hypanthium 1.5 mm. long, the perianth lobes 1.5–2 mm. long and broad; stamens 8, the filaments to 2 mm. long, united at the base; pistil rudimentary, to 1.5 mm. long; staminate flowers 2–3 per nodule, the pistillate flower borne singly; hypanthium and perianth similar but stamens rudimentary, functional pistil to 2 mm. long; fruiting inflorescence to 30 cm. long, the rachis to 4 mm. diameter at the base, the mature pedicels 3–4 mm. long, the fruit conspicuously articulate; fruit 1.8–2.4 cm. long and 1–1.2 cm. in diameter; fruiting hypanthium thick, slightly woody, with 11 bundles, the achene chestnut brown, smooth and shiny when dry.

LOCAL NAMES: *liana baur* (Dominica), *liane cacao* (St. Lucia), *cuchape* (Trinidad).

DISTRIBUTION: Guadeloupe to Trinidad (and possibly South America).

Guadeloupe: Ravine Chaud, *Questel* 752 (US), *Duss* 2180 in part (c. US); Baines Jaunes, *Stehlé* 388 (US), 1036 (NY), 1501 (US), 1989 (US), *Howard* 11796 (GH), 11812 (A, GH); Fonfarabre, *Stehlé* 3023 (NY); without location, *Duchassaing* (B). **Dominica:** Carib reserve on Castle Bruce trail, *W.H. & B.T. Hodge* 3334 (GH); Between Pointe Ronde and Milton Estate, *W.H. & B.T. Hodge* 2669 (GH); Between Riverdale and Deux Branches, *Howard* 11758 (GH), 11771 (GH). **Martinique:** Fonds St. Denis, Morne Rouge, *Duss* 36 (B, NY, US); Morne Juin, *Hahn* 1005 (B-LECTOTYPE, GH, US). **St. Lucia:** Quillesse, *P. Beard* 1089 (GH, MO, S), *Howard* 11676 (GH); Barre d'Isle, *Howard* 11388 (GH); Castries-Dennery Rd., *Howard* 11336 (GH); Patience near Micoud, *Howard* 11602 (GH). **Grenada:** Grand Etang, *Howard* 10660 (GH); without location, *Broadway* 1206 (FM). **Trinidad:** Arima valley near Simla, *A.C. Smith* 10103 (A); Aripo Savannah at Waller Field, *Howard* 10316 (GH), 10341 (GH), 10452 (GH), 10507 (A); Aripo road near $\frac{3}{4}$ mile post, *Broadway* 5992 (K); Blanchisseuse road N. of Arima, *Broadway* 7467 (BM), *Howard* 10371 (A, GH); Brazil, *Britton, Britton & Freeman* 2139 (GH, K, NY); Caparo, *Broadway* 2760 (FM); Cleaver wood west of Arima, *Simmonds* 189 (TRIN); Cumaca road, *Simmonds* 322 (TRIN); Between La Brea and Irois, *Crueger* 2694 (TRIN), 2695 (TRIN), 2696 (S, TRIN); Long Stretch, 22–23-mile post, *Broadway* 6942 (BM, FM, GH, K, MO, S); Maravel, collector unknown (TRIN 5953); Mt. Tucuche, *Baker* 14329 (TRIN), 14816 (TRIN), *Williams* 11012 (NY-TYPE of *C. quadrifida*, TRIN); Southern Guyapo road, *Broadway* 6142 (A, BM, K, S); Toco road near Sangre Grande, *Howard* 10367 (GH).

Coccoloba ascendens in the Antilles is a clearly distinct species characterized by being a liana with shiny, coriaceous and heavily veined leaves and having a large fruit with a thick, vascular hypanthium. In the original description, Lindau cites material from Brazil which I have not seen and which is not represented in the material from the Berlin Herbarium. It would be unusual if this species were not found in the Guianas or Brazil; there may even be an older name for the species.

Lindau cited a number of specimens in the original description without indicating a holotype. The specimens in the Berlin Herbarium carry no

designation to indicate a type and therefore the collection *Hahn 1005* from Martinique is selected as the type collection, with the lectotype being in the Berlin Herbarium. In 1897 Duss redescribed *Coccoloba ascendens*, including with his description the citation of specimens which Lindau had previously described as *C. dussii*. It is unfortunate that one large collection, *Duss 2180*, selected by Lindau as the type of *C. dussii*, is a mixed collection and was included by Duss in his description. While the specimen of *Duss 2180* in the Berlin Herbarium represents the taxon described by Lindau as *C. dussii*, a great number of the other collections of this number represents *C. ascendens*.

In habit *Coccoloba ascendens*, as I have seen it in the field, is a scrambling shrub or a liana. The plants were generally climbing to the tops of the tallest trees. If these were small, the plants of *C. ascendens* formed a heavy tangle on and through the low shrubs. Leaf variation on a single plant was tremendous. Different types of leaves seem to be produced by the mature wood, the young shoots and the adventitious branches. The greatest variation in leaf size and type was seen in specimens in St. Lucia. I made one collection (*Howard 11336*) where trees had recently been cut along the Castries-Dennery road. The plants on the edge of this clearing had some branches sprawling out into the cleared area while other branches climbed into the undisturbed woods. On one such plant some stems were hollow while others retained the solid pith. Some stems had lanceolate-elliptic leaves, acuminate to acute at the apex and the base, while other branches of the same plant had leaves broadly ovate-oblong, acute at the apex and truncate to cordate at the base. Variation in texture was evident in the thin, young shade leaves in contrast to the larger coriaceous leaves in full exposure to the sun. Similar variation was found on plants in the forest reserve in the center of the island. A plant of a coastal river valley had thick basal stems with leaves to 45 cm. long and 30 cm. wide, while the scrambling branches produced oblong leaves averaging 13 × 9 cm. long and broad.

Coccoloba quadrifida described by Britton is clearly a restricted growth form of *C. ascendens*. Britton reports his plant to be a small tree instead of the usually liana type, but the cited material, as well as subsequent collections from the same area, show clearly the variation that makes *C. quadrifida* the same as *C. ascendens*.

Many of the specimens cited above bear an unpublished specific name referring to the island of Guadeloupe. These are not distinguishable from *C. ascendens* in other parts of its range.

Coccoloba urbaniana was described by Lindau in his monograph of the genus in 1890. He cited specimens from Trinidad (*Crueger 2694, 2696*) and from Puerto Rico (*Sintenis 1527, 1585*); however, the description published fits only the Puerto Rican material. In a subsequent treatment of the West Indian species (*Symb. Ant. 1: 225, 1899*), Lindau again cites the Puerto Rican specimens but fails to list the Crueger specimens anywhere in the treatment. Britton later redescribed the Puerto Rican material as *C. borinquensis*, stating that Lindau had erroneously included this

in *C. urbaniana* of Trinidad. As no type was selected for *C. urbaniana* and the original author chose to limit the species to Puerto Rico, I feel that the species name has no validity in the Trinidad flora. *Coccoloba urbaniana* is best considered as a form of *C. swartzii* (Jour. Arnold Arb. 37: 328. 1956).

A most striking variation was found in the plants of this species growing in the Aripo Savannah. A number of specimens were found with the staminate and pistillate flowers on different branches of the same plant. Most of the species of *Coccoloba* which I have studied in the field have been completely or functionally dioecious. This was also true of the majority of plants found in the savannah area. However, there were enough monoecious plants seen in this area to suggest the need for careful field study in the South American species of this genus.

One collection seen but not cited above is *Duss* 72, represented by one specimen in the New York Botanical Garden herbarium. The handwritten label reports the plant to be from Antigua. During my visit to Antigua I failed to find a single ecological location which might possibly have supported the species. Since other recent collectors have not reported the species, I suspect that the label of this specimen is in error.

Coccoloba* × *boxii Sandwith (pro sp.); Howard, Jour. Arnold Arb. 37: 329. 1956.

Coccolobis boxii Sandwith, Jour. Bot. 78: 97-98. 1940.

Tree to 8 m. tall; current year's branches cinereous, striate, sulcate, pubescent; ocreae to 1.5 cm. long, densely pubescent, the base persistent, sub-coriaceous, the apex membranaceous-evanescent; leaves cordiform-ovate, 11 × 6.5 cm. long, 27 × 17.5 cm. broad, coriaceous, light, midrib pubescent; lateral veins 8-12, slightly prominent; petiole densely pubescent, 0.7-1.3 cm. long; apex obtuse, the base oblique, auriculate-cordate or rounded to nearly evenly cordate; inflorescence solitary, simple, 17-22 cm. long; rachis 1.5-2 mm. wide, sulcate, densely minutely pubescent, the nodules 1-4-flowered, the bracts broadly triangular-ovate, rounded-obtuse, 1.3 mm. long, 2 mm. wide, conspicuously pubescent, the ocreolae 2 mm. long, membranaceous, flaring, almost bilobed, glabrous at the base; pedicels to 0.75 mm. long, the hypanthium 1.3 mm. long, the perianth lobes ovate-obtuse, 2 mm. long, 1.75 mm. broad, the interior smaller, the filaments (in bud) 0.6 mm. long; ovary ovoid-ellipsoidal 2.3 mm. long, 1.3 mm. in diameter, glabrous; styles shorter than the ovary, about 0.75 mm. long.

Antigua: Pelican Bay, *Box* 539 (BM, US), 1497 (BM-HOLOTYPE, US).

The suggested hybrid nature of this species and the possible parents, *C. uvifera* and *C. swartzii* or *C. swartzii* forma *pubescens*, have been discussed in a previous paper.

Coccoloba cruegeri Lindau, Engl. Bot. Jahrb. 13: 209. 1890.

Coccoloba ernstii Johnston, Proc. Amer. Acad. 40: 685. 1905.

Tree to 12 m. tall, d.b.h. 30 cm., the wood extremely hard and tough.

the bark gray; young stems glabrous, ash-colored, striate, solid; ocreae 4–5 cm. long, membranaceous and translucent when dry, deeply split, deciduous; leaves deciduous, the petioles 2–3 cm. long, deeply grooved above, glabrous, inserted at the base of the ocrea, the blades ovate-elliptic to sub-orbicular, 14×12 to 22×16 cm. long and broad, coriaceous when mature, glabrous, the apex acute to rounded, the base rounded, the margin flat, the midrib prominent above, sharply keeled below, the primary veins 6–8 pairs, slightly prominent above, sharply keeled and prominent below, slightly decurrent on the midrib, straight becoming arcuate and anastomosing near the margin, the secondary veins and nerves reticulate; leaves of adventitious shoots with ocreae to 7 cm. long, on petioles 5 cm. long, blades mostly elliptical to 54 cm. long and 32 cm. broad, with 11 pairs of conspicuous primary veins; inflorescence racemose, laxly flowered, 7 cm. long, the rachis angled when dry, puberulent, the bracts ovate, 0.5 mm. long, the ocreolae membranaceous 0.75 mm. long, the pedicels tenuous, as long as the ocreolae, the hypanthium glabrous, 1 mm. long, the perianth lobes ovate to oblong, 1 mm. long, only staminate flowers known, these borne singly with functional stamens exerted on filaments 1.25 mm. long, the pistil rudimentary; immature fruit (according to Lindau) subglobose, the lobes of the fruiting perianth conspicuous to the base.

DISTRIBUTION: Trinidad and Margarita.

Trinidad: Without specific location, *Crueger 113* [TRIN 778] (GOET-TYPE, NY, TRIN); Monos Island, *Howard 10415* (GH); Aripo Savannah, *Howard 10505* (GH); Toco Road between Arima and Sangre Grande, *Howard 10365* (GH).

Lindau assigned *Coccoloba cruegeri* to his section *Campderia*, believing that the perianth lobes surrounding the achene remained free in fruit. The associated characters of this section of black-colored bracts and normally large, conspicuous ocreolae were not described by him and cannot be seen on the type material. The specimens in Berlin and Goettingen do not have fruits, in spite of Lindau's description of them, and the material in the Trinidad Herbarium has only fragments of a flowering inflorescence axis. Therefore it seems unwise to assign *C. cruegeri* to the section *Campderia*.

Lindau cites specimens for this species as "*Crueger 113, 778*" (Engl. Bot. Jahrb. 13: 210. 1890). Examination of the original material which is preserved in the Trinidad Herbarium shows that Crueger assigned his own collection numbers to some specimens and failed to do so to others. However, nearly all sheets were assigned numbers for the Trinidad Herbarium and in the present case the "113" is Crueger's number while the "778" is the serial number of the collection in the Trinidad Herbarium. The original collection of this material was assigned by Grisebach to *Coccoloba plumieri*, according to the label on the specimen, although this information was never published. The label also indicates that the collection was made in the vicinity of Caroni.

There is a strong similarity between *Coccoloba nigrescens* and *C. cruegeri*, and perhaps future collections of more adequate material will indicate either that they are the same or that material called *C. cruegeri* is in reality

a hybrid population. Both species are unique in the Trinidad area in having deciduous leaves. *Coccoloba nigrescens* appears to develop flowers when the leaves are very small, while *C. cruegeri* has nearly mature leaves before any indication of the inflorescence is produced. I found only one plant in flowering condition and on this the flowers were just beginning to open. These were borne singly at the nodules and were staminate.

The several plants seen in the field all possessed multiple trunks but were without indication of injury. One trunk possessed leaves much larger than normal as described above. In both normal and adventitious shoots the leaves were characterized by the remarkably sharply keeled midribs. In this characteristic the plant could be distinguished easily from neighboring plants of *C. nigrescens*. Several of the local residents were familiar with plants assigned to these two species. They recognized these as "grapes" similar to *Coccoloba uvifera* but could not recall having seen fruits on the trees.

Coccoloba ernstii Johnston described from Margarita Island is to be referred here. The type specimen (*Johnston 250*) in the Gray Herbarium indicates that this tree, also, is deciduous and that the young leaves and inflorescences are comparable to the material cited from Monos. Johnston indicated the alliance to *C. cruegeri* in his original description.

Coccoloba diversifolia Jacq. Enum. Pl. 19. 1760, Hist. Stirp. Amer. 114. *pl.* 76. 1763.

Coccoloba cubensis Meisner, DC. Prodr. 14: 162. 1857.

Coccoloba laurifolia Lindau, Engl. Bot. Jahrb. 13: 158. 1891, and all recent authors, not Jacquin.

Coccoloba longifolia Schmidt, Rep. Spec. Nov. 24: 73. 1927, not Fischer ex Lind.

Shrub or tree to 8 m. tall; branches terete, often geniculate by limited growth, glabrous, the nodes rarely slightly swollen; ocreae coriaceous in the persistent lower portion, membranaceous and deciduous above, 3–5 mm. long; leaves of normal shoots with petioles 7–10 mm. long, glabrous, arising from the base of the ocreae; blades ovate, oval, oblong, elliptic, lanceolate or obovate, variable on one branch, 4 × 3.5, 7 × 5.5, 8 × 4.5, 12 × 8 cm. long and broad, coriaceous, often shining above, dull beneath, glabrous, the apex rounded, obtuse, acute or acuminate, the base cuneate, rounded or subcordate, the margin entire; midrib and primary veins slightly prominent above, the secondary venation reticulate on both surfaces, the primary veins 3–7 pairs, arcuate, anastomosing before reaching the margin; leaves of adventitious shoots on petioles 1–2.5 cm. long, with blades of varying shapes 17 × 8, 24 × 13, to 32 × 12.5 cm. long and broad; leaves of windswept specimens often much smaller than those of normal shoots with blades 2 × 1.3 to 3 × 2 cm. long and broad; inflorescence terminal 4.5–18 cm. long, the rachis glabrous, the flowers on pedicels 2–4 mm. long, the staminate flowers 2–4 at each locus, the pistillate flowers borne singly at each locus, the bracts ovate, less than 0.5 mm. long, the ocreolae membranaceous, less than 0.5 mm. long, the hypanthium 1 mm. long, the

perianth lobes ovate to oblong, 2–3 mm. long, 1–2 mm. broad, the functional stamens 1 mm. long, the sterile stamens rudimentary; fruiting pedicels 3–4.5 mm. long, the fruit globose to obpyriform, 10×7 , 12×8 , 13×8 mm. long and in diameter, the apex rounded, the perianth lobes imbricate and appressed.

DISTRIBUTION: Florida, the Bahamas, the Greater Antilles and Antigua.

Antigua: Pelican Bay, *Howard 11990* (GH).

Coccoloba dussii Lindau, Notizblatt Berlin 1: 213. 1896, Symb. Antil. 1: 226. 1899; Duss, Ann. Inst. Col. Marseille 3: 167. 1897.

Coccoloba scandens Benth. in obs. Lond. Jour. Bot. 4: 625. 1845, nomen.

Coccoloba excelsa Smith (?), Kew Bull. 1893: 272. 1893.

Woody shrub with scrambling branches or a vine; young stems terete, minutely short pilose becoming glabrous, the older stems flattened through bilateral development; ocreae to 1 cm. long, membranaceous, deciduous; petiole inserted below the ocrea, 2.5–4 cm. long, minutely pilose; blades ovate to oblong, 6.5×4.5 , 12×7.5 to 17×10.5 cm. long and broad, thin-coriaceous, glabrous, the apex acute to short-acuminate, the base rounded to slightly cordate, the margin entire, the midrib prominent below, slightly keeled above, the secondary veins 7–8 pairs, arcuate, anastomosing near the margin, the ultimate venation reticulate and conspicuous on both surfaces; leaves of adventitious shoots on petioles 3.5 cm. long, the blades broadly ovate to elliptic-ovate, 25×16 to 30×19 cm. long and broad, the apex rounded to acute, the base broadly cordate; leaves of younger shoots elliptic-lanceolate, 19×10 to 24×10.5 cm. long and broad, the apex acuminate, the base rounded or acute; inflorescence terminal, 9–15 cm. long, the basal ocrea 1.3–4.3 cm. long, the rachis minutely pilose or puberulent, the bracts less than 1 mm. long, the ocreolae 0.5 mm. long, the flowering pedicels to 3 mm. long, the hypanthium 2 mm. long, the perianth lobes ovate, 2 mm. long, the staminate flowers borne 2 or 3 at a node, the pistillate flowers not known; fruiting pedicels 4–6 mm. long, usually slightly reflexed, slender, the mature fruit short stipitate, spherical, dark blue-purple in color, extremely astringent, the surface of dried fruit rugose, the fruiting perianth tightly adherent to the achene, the achene dull brown, rugose.

LOCAL NAMES: *Raisinier marron*, *Raisin marron* (Guadeloupe).

DISTRIBUTION: Guadeloupe, St. Lucia, St. Vincent, Grenada, Trinidad and Tobago.

Guadeloupe: Ravine Chaude (Lamentin), *Duss 2180* (B-TYPE, C, FM, NY); Between Pointe Noire and Ravine Chaude, *Duss 3711* (B, FM, NY, US); Between Lamentin and Pris d'Eau, *Howard 11852* (A, GH); Grande Savane, Gourbeyre, *Duss 3430* (B, NY); Goyave, Pont Moreaux, *Stehlé 931* (US); Basse Terre near Duclos, Petit Bourg, *A.C. Smith 10347* (A). St. Lucia: Without location, *Anderson s.n.* (K). St. Vincent: Silver Spoon district above Three Rivers, *Howard 11161* (GH), *11185* (GH), *11189* (GH). Grenada: Grand Etang, *Howard 10656*

(GH). Tobago: Easterfield, *Broadway 4371* (NY); The Widow, *Broadway 4653* (K, MO). Trinidad: Between Arima and Sangre Grande, *Howard 10362* (GH); Blanchisseuse Road, *Broadway 6456* (A); Morne Bleu, *Britton, Freeman & Bailey 2271* (GH).

Similar to many other lianas, *Coccoloba dussii* varies according to the attitude of the stem and its branches. Over fifty feet of liana was pulled from trees or untangled from prostrate growth in several locations to determine the range of leaf variation in single plants. Basal leaves which persisted on the older stems were usually larger than the others on the plant. Leaves on apical portions of the stem were usually longer and narrower than the other leaves, while the smallest leaves occurred on the lateral flowering or fruiting branches. Such flowering branches are represented by most of the herbarium specimens cited. Flowering branches which were twisted around limbs of the supporting trees as an aid in climbing had the smallest leaves and the shortest inflorescences.

The bilateral development of the older stems was conspicuous. Such stems were often 5–6 times as wide as thick. Young stems were cylindrical but slightly fluted, with a conspicuously large pith.

Coccoloba dussii is similar to *C. excelsa* and in sterile condition it is often difficult to distinguish between them. In most South American material of *C. excelsa* the leaves, young stems and inflorescences are conspicuously pubescent. In some South American material the pubescence has been lost, leaving relatively large hair bases with evidence of hairs only along the midrib, on the lower surface of the lamina and in the axils of the lateral veins. Such hair bases have often been mistaken for glands or secretions. Both functionally staminate and pistillate flowers of *C. excelsa* are known and in each the ocreolae surrounding the flowering pedicels are large, membranaceous and more or less persistent, almost equalling the pedicels in length in flowering condition. Only staminate flowers are known for *Coccoloba dussii* and in these the ocreolae are small and less than 1/5 the length of the pedicels. The inflorescence rachis and the ocreolae are only slightly puberulent. I have not observed *C. excelsa* in the field, but on the basis of herbarium material alone the character of the ocreolae in flowering condition is sufficient to distinguish the species. The fruits likewise are similar, as is the growth habit, and the appearance of the leaves in dried condition. In general the leaves of *C. dussii* tend to be more umbonate between the veins and to have thinner and slightly longer petioles. The flowers are commonly reflexed on the inflorescence, although this characteristic may be associated with the growth habit of the plant. Further field study and additional collections may indicate that *C. dussii* should be considered a variety of, or even synonymous with, *C. excelsa*.

Lindau described *Coccoloba dussii* in 1896, citing only one specimen, *Duss 2180*, in the herbarium of Krug and Urban. The type in the Berlin Herbarium consists of one branch and is as Lindau described. Other specimens bearing this collection number are mixtures of *C. dussii* and *C. ascendens*.

In describing *Coccoloba excelsa*, Bentham notes that "In Forsyth's

herbarium, I found, under the name of *C. scandens*, an imperfect specimen of a plant gathered by Anderson in Saint Lucia, very much like the above, but with the leaves perfectly smooth, the racemes much longer and the bracts very small. These are the only two species as yet known to be climbers." I have seen the plant from Bentham's herbarium which is now in the collection at the Royal Botanic Garden at Kew. It is a fragment consisting of two leaves and one inflorescence; the latter is staminate, but very few flowers remain. The specimen is better referred to *C. dussii* than to *C. excelsa*. It is to be expected that more thorough exploration of St. Lucia will reveal *C. dussii*, which has not been reported in recent collections from that island. *Coccoloba dussii* is known from Guadeloupe, but has not been found on Martinique or Dominica to the present.

Coccoloba fallax Lindau, Engl. Bot. Jahrb. 13: 172. 1890.

Coccoloba crescentiifolia Griseb. Fl. Br. W. I. 163. 1859, not Cham.

Tree to 10 m. tall (Swabey), d.b.h. 6 cm.; branches thick, strongly striate; ocreae coriaceous, 2–4 cm. long, flaring, strongly bilobed, conspicuously striate, glabrous; petioles arising from the base of the ocreae, 2.5–4.5 cm. long, stout, deeply grooved, striate, glabrous; leaf blades oblong-ovate to oblong-obovate, 14×5 , 23×10 , 25×11 , 36×13 cm. long and broad, thick-coriaceous, glabrous, the apex acute to acuminate, the base rounded or narrowed, the ultimate base slightly cordate, the midrib conspicuous above, keeled, sulcate or grooved at both sides, strongly keeled and conspicuous below, the veins 7–10 pairs, ascending arcuate, anastomosing near the margin, slightly impressed above, conspicuous below, the ultimate venation reticulate but inconspicuous; inflorescence lateral, fasciculate, racemose, laxly flowered, the basal ocreae conspicuous, coriaceous 3 cm. long, mostly persisting, commonly strongly keeled or striate, glabrous or puberulent, the rachises 7–23 cm. long, puberulent, the flowers borne singly at each nodule, the bracts ovate, minute to 0.5 mm. long, puberulent, the ocreolae puberulent, scarcely exceeding the bracts, the staminate flowers with pedicels 2–3 mm. long, puberulent, the hypanthium 1 mm. long, the perianth ovate, the lobes 1.5 mm. long, the functional stamens with filaments 2–2.5 mm. long, the pistillate flowers not seen; fruiting pedicels 2–3 mm. long.

LOCAL NAMES: *Black grape* (Trinidad).

DISTRIBUTION: Trinidad and Venezuela.

Trinidad: Without locality, *Crueger 114* (GOET-TYPE), 779 (TRIN); S. W. Reserve, *Swabey* [TRIN 12292] (NY); Cat's Hill Reserve, *Swabey* [TRIN 12543, 12536]; Black River, *Freeman 8102* (NY, TRIN); Windbelt Reserve, *Brooks* [TRIN 12502] (NY). **Chacachacare:** *Britton, Freeman & Watts 2694* (GH, NY, TRIN). **Venezuela:** Cristobal Colon, *Broadway 685* (GH); Cariaquita, *Bond, Gillin & Brown 244* (GH); Fundo la Argentina, *Delgado 209* (A).

Coccoloba fallax is very similar to *C. densifrons* and *C. padiformis*. When more adequate material is available, especially when there is a good

series of fruits and more information on the growth habits, these species may be considered to be merely varieties, or even identical.

I was unable to find *Coccoloba fallax* in Trinidad or on Chacachacare. Data on the specimens cited are inadequate for a complete understanding of the form of the plants. No female flowers are known and the few fruits associated with specimens collected by Swabey (TRIN 12536) and Freeman (TRIN 8102) are crushed and in poor condition. The fruits were probably round or spherical with imbricated perianth lobes. The achenes were a pale tan color in the material seen, apparently also spherical and very thin-walled.

Swabey reports that one specimen which he collected grew as a clump tree of 2 to 6 stems. Some of these reached 30 feet in height. Neither these nor other specimens studied appeared to represent adventitious shoot material.

At present *Coccoloba fallax* seems distinct on the basis of the fascicled inflorescence of simple racemes, the conspicuously large ocreae, particularly those of the inflorescence, and the strongly keeled midribs of the leaves.

Coccoloba krugii Lindau, Engl. Bot. Jahrb. 13: 145. 1890; Symb. Antil. 1: 222. 1899; Howard, Jour. Arnold Arb. 37: 337. 1956.

Coccoloba borgesensis Schmidt, Rep. Spec. Nov. 24: 75. 1927.

Coccoloba borgesensis forma *ovato-lanceolata* Schmidt, Rep. Spec. Nov. 24: 76. 1927.

Shrub or small tree to 6 m. tall; branches terete, glabrous, slightly geniculate and nodose; ocreae membranaceous, persistent, 3–5 mm. long; leaves of normal shoots with petioles 5–6 mm. long, corky at the base, arising from the base of the ocreae; blades ovate to suborbicular, 2 × 1.8, 4 × 3.5, 5 × 4 cm. long and broad, thin-coriaceous, glabrous or rarely with a few hairs near the attachment of the petiole, the apex obtuse or rounded, the base cordate or rounded, the margin flat or recurved; midrib flat above, slightly prominent below, the primary veins 4–6 pairs, straight bifurcating and anastomosing near the margin, flat on both surfaces, the secondary venation minutely reticulate below, smooth above; leaves of adventitious shoots with petioles 1 cm. long, the blades cordate or elliptic to 7 × 6 cm. long and broad; inflorescence terminal 5–8 cm. long, the rachis glabrous, the staminate flowers 1–3 per node, the pistillate flowers borne singly, the bracts broadly ovate, membranaceous, 1 mm. long; ocreolae membranaceous, flaring to 1 mm. long; pedicels wanting or shorter than the ocreolae, the hypanthium 1 mm. long, the perianth lobes ovate, to 2 mm. long, the filaments of fertile stamens 1.5 mm. long; fruit ovoid or angularly fusiform, strongly triangular in outline, 4–5 mm. long, 3–3.5 mm. in diameter, the perianth lobes appressed, about half the length of the fruit.

DISTRIBUTION: The Bahamas, Hispaniola, Jamaica, Puerto Rico, the Virgin and the Leeward Islands.

Antigua: Goble creek near Gaynors, Box 1388 (A, GH, US).

Coccoloba latifolia Lam. Encycl. 6: 61. *t.* 316, *f.* 4. 1804; Lindau, Engl. Bot. Jahrb. 13: 133. 1890.

Small tree to 15 m. tall, d.b.h. to 45 cm.; branches thick, angular and vertically ridged at least when dry, hollow but septate at the nodes, glabrous; ocreae large, conspicuous, coriaceous, tubular or sub-campanulate, 3–7 cm. long, glabrous, acute to strongly bilobed; leaves of flowering branches variable in size, the petioles generally 2–3 cm. long, glabrous or puberulent or occasionally with long pilose hairs; blades generally orbicular to obovate, 13×10 , 20×15 to 28×28 cm. long and broad, coriaceous, glabrous or with scattered pilose hairs on the midrib and veins on the lower surface, the apex rounded or emarginate to short acuminate, the base rounded to deeply cordate, the margin flat or strongly recurved, entire, often undulate; midrib and veins impressed above, conspicuous below, the primary veins 9–12 pairs, arcuate and anastomosing near the margin, the secondary venation conspicuous, the blade strongly bullate between the primary veins or between the secondary veins as well as the primary or scarcely bullate and nearly flat; leaves of adventitious shoots larger with petioles to 5 cm. long and blades to 48×50 cm. long and broad or larger, similar in other characteristics; inflorescence terminal, paniced to 30 cm. long and broad, with solitary or 2–3-fascicled undivided pseudo-racemose branches or rarely the lowest branch paniculate, the rachis puberulent, the staminate flowers 1–3 per node, the pistillate flowers usually borne singly but some apparently 3–4 per node, the bracts minute, to 0.5 mm. long, the ocreolae membranaceous to 0.75 mm. long, the pedicels very thin 1–2 mm. long, the hypanthium tapered at the base, 1–1.6 mm. long, the perianth lobes 1.5 mm. long, the functional stamens with filaments to 2 mm. long; fruit ovoid, 7–10 mm. long, 5–6 mm. in diameter, the base rounded to slightly attenuate, the apex rounded with imbricate perianth lobes, the immature fruits showing 9 conspicuous basal nerves when dry, the mature fruit black, fleshy when fresh, the outer pericarp commonly loose, the achene dark brown shining, smooth.

LOCAL NAMES: *Grape, cuchape, stave wood, big leaf.*

DISTRIBUTION: Trinidad, Tobago, Venezuela, British Guiana, Brazil.

Trinidad: San Fernando, La Retraite, *Crueger 2690* (B, TRIN); Tamana, *Marshall* [TRIN 12313] (NY); St. Joseph, *Dannouse, s.n.* (TRIN); Aripo Savanna, *Britton, Broadway & Hazen 316* (GH, NY), *Howard 10355* (GH); Talparo, *Simmonds* [TRIN 14652]; Arima, *Eggers 1377* (C); Piarco Savanna, *Britton, Britton & Hazen 113* (NY); Chancellor Road, St. Ann's, *Broadway 8989* (TRIN); Caroni, *Eggers 912* (M); cultivated, *Broadway 4332* (TRIN). **Monos Island:** *Howard 10416* (GH).

A well-defined and easily recognized species. The trees are common in savanna areas and probably for these reasons have not been collected and so the species is poorly represented in herbaria. The wood tends to be soft and the branches are relatively brittle and fragile. An equal hazard to the collector is the occurrence of colonies of stinging and biting ants in the hollow pith and in the ocreal sheath.

Coccoloba nigrescens Lindau, Engl. Bot. Jahrb. 13: 192. 1890.

Tree to 10 m. tall; youngest stems pubescent with long strigose hairs, becoming glabrate; ocreae lax, membranaceous to extremely thin and translucent even when fresh, to 3.5 cm. long, divided $\frac{2}{3}$ its length, acute at the apex, pubescent with long scattered hairs, deciduous to the base; petioles attached at the base of the ocreae, stout, 5–7 mm. long, densely pubescent on the adaxial surface when young, becoming glabrate; leaf blades obovate-oblong to ovate-oblong, 12×7 to 16×9 cm. long and broad, thin-coriaceous when mature, glabrous, the apex acute to rounded, rarely short-acuminate, the base cuneate or rounded, the margin slightly recurved, the midrib prominent on both surfaces, not keeled, the primary veins 6–9, mostly straight becoming arcuate and anastomosing near the margin, the lesser nerves inconspicuous; inflorescence terminal or lateral, to 10 cm. long, the peduncle 6 mm. long, strigose pubescent becoming glabrous, the bracts triangular, acute, puberulent, 0.75 mm. long, the ocreolae erect, truncate, not exceeding the bracts; staminate flowers 2 (rarely 1) per nodule, the pedicels shorter than the ocreolae, the hypanthium 0.75 mm. long, the perianth lobes ovate to 0.75 mm. long, the stamens exerted on filaments 1 mm. long; pistil rudimentary, the pistillate flowers not known; old fruiting inflorescence with stout pedicels to 1 mm. long; fruit not known.

DISTRIBUTION: Islands near Trinidad.

Chacachacare Island: *Crueger 116* (B, GOET-TYPE, TRIN), *Howard 10440* (GH).
Monos Island: *Crueger* [TRIN 3244], *Britton & Hazen 1742* (FM, GH, NY, TRIN), *Broadway 7457* (TRIN), *Howard 10422* (GH).

Coccoloba nigrescens is apparently one of the few species of the genus which loses all of its leaves at certain seasons. However, there is no indication of this characteristic in the shape or texture of the mature leaf. Lindau described the species from specimens collected in May while the leaves and inflorescences of the plant were very young and immature. Subsequently, Britton and Hazen collected the species again on an adjacent island in the month of April and obtained specimens comparable in quality. Lindau commented on the fragility of the leaves which turn black in drying. The Broadway collection cited above was collected in November and consists of mature leaves from a sterile shrub. The collections which I made were obtained in the month of February in the type locality and in the same area where Britton visited. These also possess fully mature leaves. The leaves turn dark on drying and all parts of the plant are glabrous, lacking the hairs apparently characteristic of the younger parts. My companion in the field, a local resident and employee at the leper colony, assured me that this plant does indeed lose its leaves. At present this species is poorly represented and not well known. Further collections are needed, especially to determine whether this species is truly distinct from *C. cruegeri*. At present *C. cruegeri* may be distinguished in the juvenile leaf condition by the lack of the strigose pubescence and in mature leaf form by

the longer petioles, larger adventitious shoot leaves and the sharply keeled midrib.

Both of the Crueger specimens which represent the type collection are in very poor condition.

Coccoloba nitida HBK. Nov. Gen. 2: 176. 1818.

Polygonum arborescens Vell. Flor. Flum. 163. 1825, 4: pl. 43. 1827.

Coccoloba marginata Hooker, Jour. Bot. 4: 626. 1845.

Coccoloba guianensis Meisner, Linnaea 21: 264. 1848.

Coccoloba martii Meisner, Fl. Bras. 5: 37. 1855.

Coccoloba martii Meisner var. *major* Meisner, Fl. Bras. 5: 38. 1855.

Coccoloba nitida HBK. var. *rotundata* Meisner, Fl. Bras. 5: 88. 1855.

Coccoloba nitida HBK. var. *cordata* Meisner, Fl. Bras. 5: 38. 1855.

Coccoloba trinitatis Lindau, Engl. Bot. Jahrb. 13: 182. 1890.

Plants of variable habits most commonly tree-like at the base with scrambling, liana-like branches, the nodes extremely long and the leaves much reduced at the ends of these or liana-like from the base, rarely shrub-like; branchlets terete, smooth or striate, minutely puberulent, the lenticels elliptical, conspicuous, whitish; ocreae obliquely truncate, 1–1.5 cm. long on normal as well as scrambling shoots, ferruginous puberulent when young becoming glabrate, the base coriaceous and persistent usually tightly investing the stem; petioles inserted at the base of the ocreae, usually 1.5–2 cm. long, minutely puberulent, canaliculate above, striate; leaf blades of flowering branches ovate, elliptic, oval-oblong or obovate-oblong, 10 × 5, 13 × 6 to 20 × 8 cm. long and broad, coriaceous, shining or dull, usually drying darker above than below, glabrous on both surfaces, the apex acute, rarely acuminate or almost rounded, the base rounded to cordate, the margin flat rarely slightly recurved, the midrib and veins slightly impressed above, conspicuous below, the primary veins 8–10 pairs, arcuate, anastomosing near the margin, the ultimate venation finely reticulate; leaves of conspicuously scrambling shoots either much smaller or even larger (to 24 × 10 cm.) than those of normal flowering branches, generally of shinier texture; leaves of adventitious shoots on petioles 1.2–3.5 cm. long, with blades generally oblong or elliptic-oblong, 17 × 10 to 21 × 12 cm. long and broad, the apex usually rounded, the blade often strikingly umbonate between the primary veins; inflorescence generally terminal but often lateral, a solitary raceme, 7, 10, 22 to 36 cm. long, occasionally fascicled with one or two small racemes at the base or with 1 or 2 basal racemes developing from the main axis; rachis puberulent; bracts ovate 0.5–1 mm. long, the ocreolae strongly bilobed, membranaceous, puberulent, 1.5–2 mm. long, the staminate flowers 2 or 3 at each node, on pedicels shorter than the ocreolae, the hypanthium conical 1–1.5 mm. long, the perianth lobes ovate, 1–1.5 mm. long, the stamens 1.5–2 mm. long, the pistil abortive; pistillate flowers borne singly on pedicels about equalling the ocreolae, the stamens rudimentary and shorter than the perianth lobes, the pistil exserted, the fruiting pedicels 2–2.5 mm. long; fruit ovoid (usually 12 mm. long, 9 mm. diameter), the perianth lobes

slightly coronate, the hypanthium in fruit smooth to strongly striate when dry, the achene dark brown, smooth.

LOCAL NAMES: *Black grape* (Trinidad), *masari* (British Guiana), *pipoca* (Brazil).

DISTRIBUTION: Trinidad, the Guianas, Brazil.

Trinidad: Arima, *Howard 10359* (GH), *10368* (GH), *10506* (GH); Aripo Savannah, *Crueger 2693* (B-TYPE of *C. trinitatis*, TRIN), *Howard 10507* (GH), *Britton, Britton & Hazen 272* (GH, NY), *Baker s.n.* (HT 15122), *Broadway* (TRIN 10480); Caroni, *Crueger 671* (TRIN); Long Stretch, *Simmonds 329* (TRIN 14255), *s.n.* (TRIN 15378); Santa Cruz, *Dannouse s.n.* (NY, TRIN); Valencia, *Broadway 5584* (A, BM, MO, S), *6652* (A, B), *8988* (TRIN), *Britton, Britton & Hazen 1023* (GH, NY); *Britton & Britton 2103* (GH, NY); without locality, *Fendler 1010* (BM). **British Guiana:** Amakura River, *De La Cruz 3552* (GH); Assakatta, *De La Cruz 4270* (GH); Barima River, *De La Cruz 3363* (GH); Bartica River, *De La Cruz 1962* (GH); Kaieteur Plateau, *Maguire & Fanshawe 23316* (A); Kuyuwini River, *Smith 3030* (A); Mazaruni Station, *For. Dept. Brit. Guiana 4269* (NY); Upper Rupununi River, *De La Cruz 1442* (GH). **Dutch Guiana:** without location, *Samuels 419* (GH), *Wullschlagel 882* (B). **French Guiana:** Acaronany, *Sagot 887* (NY); Paramaribo, *Regel 492* (NY); without location, *Broadway 307* (GH), *Leblond s.n.* (B), *Jelski* (B), *Perrottet 84* (NY), *Poiteau* (B). **Brazil:** Maranhão, Island of São Luiz, *Froes 11698* (A), *11716* (A); Minas Geraës, river San Francisco near Salgado, *Martius* (M-TYPE of *C. martii*); Bahia, Joazeiro, *Martius* (M-TYPE of *C. nitida*).

In the field there is considerable variation among plants of this species. I was fortunate to have one full week in the Arima area of Trinidad, where attention was given to the growth habits and the variation seen in plants then referred to *Coccoloba trinitatis* Lindau. The three collections made at that time (*Howard 10359, 10368 and 10506*), comprise the equivalent of 47 herbarium sheets. However, each number was made from only one plant and each number was collected on a separate wooded island in the Aripo Savannah. By carefully following the branches of each tree I was able to determine that a tenuous "liana" of one part of the forest canopy was actually the same individual as the "different" plants of the forest floor which were, in reality, either flowering branches or adventitious shoots.

As a result of this experience in the field, it seems clear to me that the specimens Lindau saw and referred to *Coccoloba nitida*, *C. guianensis*, *C. marginata* and *C. trinitatis* could all have come from one plant. They obviously did not come from one plant, but nevertheless I conclude that they represent only one species. Many of the morphological differences by which Lindau distinguished species can be found on a single plant in the field. Moreover, he failed to understand the sexual differences between staminate and pistillate plants. Meisner, Lindau's predecessor, treated as varieties the different leaf sizes on a series of specimens. These varieties "major" and "minor" are easily found on one branch in the living plant.

Coccoloba nitida will be recognized in future collections as a liana, for the flowering branches are usually short lateral shoots on a scrambling branch system. The flowers are a clearer white than most of the *Coccoloba*

species I have seen in the field and the staminate inflorescence in full flower is conspicuous. The long inflorescence, the membranaceous, bilobed ocreolae and the ovate fruits aid in the determination of this species.

Coccoloba novogranatensis Lindau, Engl. Bot. Jahrb. 13: 192. 1890.

Coccoloba caribaea Urban, Symb. Antil. 5: 337. 1907.

Shrub 2 m. to tree 27 m., trunk commonly muscular, the bark red; branchlets terete, glabrous, the nodes slightly swollen; ocreae cylindrical, the upper portion membranaceous and deciduous, the lower portion coriaceous and persistent; leaves of normal shoots with petioles 8–11 mm. long, puberulent when young, with age glabrous except in the groove, attached above the base of the ocreae; blades ovate to ovate-elliptic, 6×4 , 9×5 , 10.5×5.5 cm. long and broad, thin-coriaceous, glabrous above, glabrate below except for long hairs along the midrib at the base of the blade, the apex attenuate, the base narrowly cordate, the margin entire; midrib and primary veins inconspicuous above, prominent below, the primary veins 5 or 6 pairs, the ultimate venation finely reticulate; leaves of adventitious shoots generally similar but occasionally obovate and narrowed at the base, ovate-lanceolate or lanceolate-elliptic, the blades 11×7 to 18×15 cm. long and broad, the basal lobes of leaves on adventitious shoots often overlapping; inflorescence terminal on short lateral shoots, 3–9 cm. long, the basal ocreae 5–10 mm. long, bilobed at the apex, the rachis glabrous, the flowers commonly borne singly at each nodule (occasionally 2 in staminate plants), the bracts oblong; 2 mm. long, 0.5–0.75 mm. broad, the ocreolae 3 mm. long, bilobed at the apex, membranaceous and persistent, the pedicels 2.5–4 mm. long, the hypanthium 0.75 mm. long, the perianth lobes ovate, 1.5 mm. long and broad, the functional stamens 2.5 mm. long, the functional pistil 2 mm. long; fruit generally spherical with coronate perianth lobes, occasionally narrowed at the base, 1 cm. long, 5–9 mm. in diameter, the achene brown, shining.

DISTRIBUTION: St. Vincent, Grenada, Trinidad, Tobago, Margarita, Colombia, Venezuela and Panama.

St. Vincent: *H.H. & G.W. Smith* 1790 (B, NY). **Grenadines:** Bequia, *Howard* 11231 (GH), 11241 (GH); Cannuoan, *Howard* 11091 (GH); Carriacou, *Howard* 10815 (GH), 10818 (GH), 10890 (GH); Large Island, *Howard* 10965 (GH); Mayero, *Broadway* 5748 (TRIN), *Howard* 11038 (GH); Mustique, *Howard* 11223 (GH); Petit Martinique, *Howard* 10935 (GH); Petit St. Vincent, *Howard* 10896 (GH); Tobago Cays, *Howard* 11024 (GH); Union, *Howard* 10988 (GH). **Grenada:** St. Georges, *Broadway* 1760 (B, FM, GH, NY), 1795 (FM, GH, NY), *Howard* 10692 (GH); Grand Anse, *Broadway* 2503 (FM, MO), 3361 (B, M); Sauteurs, *Howard* 10705 (GH). **Trinidad:** Caledonia Island, *Hart* 5834 (TRIN). **Tobago:** The Lodge, *Broadway* 4019 (B, FM), *Howard* 10453 (GH), 10454 (GH), 10458 (GH). **Carrera Island:** *Broadway* s.n. (NY). **Margarita:** *Johnston* 274 (GH).

In the original description of *Coccoloba novogranatensis*, Lindau cited a Karsten collection from Sabanilla, Colombia, and a Triana specimen

without specific locality. In the Berlin Herbarium there are two sheets representing this species, but in contrast to his usual practice, Lindau did not indicate by abbreviation, or otherwise, his choice of a type. The Triana specimen is a fragment of a leaf in a packet with a pencil sketch of a fruit on the packet. The Berlin sheet attributed to Karsten consists of two flowering fragments of different ages. It would appear that the Karsten specimen in Berlin could be considered the holotype; however, when botanists from the Field Museum photographed this specimen, temporary annotations were placed on the "Karsten" sheet to indicate that one of the two flowering fragments was a Karsten collection and the other a Triana collection. The labels have since been removed. Thus I have been unable to verify whether this sheet is truly a mixed collection. Both flowering fragments apparently represent the same species, but I am unable to state positively which is the type. It is likely that additional Karsten material from Colombia exists in other herbaria and that a lectotype should be selected at a future date.

I have seen in the herbarium of the Muséum National d'Histoire Naturelle in Paris two full sheets of *Triana 978*, a number cited by Lindau. The collection was made between Anapoima and Apulo, Province of Bogota in Colombia. Each of the two sheets has a branch with young flowers and a second branch in fruiting condition. No fruits remain with the specimens.

I have not seen additional material collected by Karsten. Lindau indicated that his specimens of this species came from Berlin, Leningrad and Vienna. The first two collections are intact and I have seen all the material. The Vienna collection of this genus was destroyed during World War II. While it is possible that Karsten material exists in some other herbarium, it seems practical at this time to designate *Triana 978* as the type collection and one of the two sheets in the Paris herbarium is selected as the lectotype.

In the herbarium material from the Muséum d'Histoire Naturelle in Paris there are three additional sheets to be referred to *Coccoloba novogranatensis*. All were collected by Pleé. Two sheets, one with a printed and one with a script label, were collected at Maracaibo (Venezuela). The third carries a printed label "Martinique." I cannot distinguish the specimens as distinct and different collections and since *C. novogranatensis* has not as yet been collected in Martinique, I suspect that this sheet too should bear a Maracaibo label.

Urban did not indicate a holotype in his publication of *Coccoloba caribaea*, but the specimen *Broadway 1760* in the Berlin Herbarium is indicated as the type in Urban's handwriting. This collection is in flower and is comparable in all characteristics to the fragments on which Lindau based *C. novogranatensis*. There have been no recent collections assigned to *C. novogranatensis*; in fact, the name has been overlooked in recent years. A number of recently described species from Colombia and Peru and from Central America will be assigned in synonymy to *C. novogranatensis* in a later paper.

A large number of *Coccoloba novogranatensis* populations were studied

in the Lesser Antilles and a considerable morphological variation was recognized as being of an ecological nature. The size, color, texture and attitude of the leaves on the shoots seemed to depend upon whether the populations are growing in full sunlight, in shade, in an area subject to salt spray or in moist situations. A similar set of variations has also been recognized in *C. venosa* and collections of these two species from the Lesser Antilles have been confused by various authors. For example, the plants on Mt. Royal in Cannuoan in the Grenadines which John Beard refers to *C. venosa* are more properly referred to this species. *Coccoloba venosa* and *C. novogranatensis* may be readily distinguished by referring to the point of attachment of the petiole to the ocrea.

Coccoloba pubescens L. Syst. ed. 10. 1007. 1759; Hooker, Bot. Mag. t. 3166. 1832; Fawcett & Rendle, Jour. Bot. 51: 123. 1913; Howard, Jour. Arnold Arb. 38: 227. 1957.

Scortea arbor americana, amplissimis foliis, aversaparte nervis extantibus hirsutie ferruginea refertis; Pluk. Phytographia t. 222, f. 8. 1691.

Coccoloba grandifolia Jacq. Enum. 19. 1760.

Coccoloba rubescens L. Sp. Pl. ed. 2. 523. 1762.

Coccolobis pubescens Sandwith, Jour. Bot. 78: 98. 1940.

Coccolobis antiguensis Sandwith, Jour. Bot. 78: 98. 1940.

Mature tree to 13 m. tall, d.b.h. 5 cm., much branched above a well-defined trunk; branches terete, swollen at the nodes, the lenticels not conspicuous, tomentose to pilose; ocreae to 1 cm. long, generally completely deciduous, pubescent; leaves of completely mature plants vary considerably in size and shape, the petioles 3–6 mm. long, inserted below the ocreae, densely short-pubescent, the blades broadly orbicular to orbicular-ovate, 4 × 6, 7.5 × 10 cm. long and broad grading into size of leaves of adventitious shoots, rugose or bullate, the apex rounded, the base cordate, the basal lobes rounded and only rarely approximate, sparsely pubescent above to glabrate, densely to sparsely pubescent below or glabrate, the margin undulate, the venation of 5 pairs of primary veins, arcuate to the margin, strongly anastomosing, slightly impressed above, conspicuous and reticulate below; adventitious shoots generally strict and sparsely branched, to 10 m. tall; branches stout, terete, slightly swollen at nodes, strongly grooved or striate; ocreae 2 cm. long, membranaceous and evanescent above, coriaceous and persistent below, the petioles stout 1–2 cm. long, densely tawny pubescent; blades large, generally orbicular except for the terminal leaf, frequently broader than long, 30 × 40, 50 × 80 cm. long and broad, coriaceous, rugose or bullate when mature, thin and plane when young, the apex rounded, the base rounded to cordate, the basal lobes commonly encircling the stem, the terminal leaflet commonly rhombic, longer than broad when mature, densely tomentose, the veins slightly impressed above, all venation conspicuous and reticulate below; midrib and secondary veins persistent pubescent above, the others sparsely pubescent when young, becoming glabrate above, the veins and leaf surface pubes-

cent or becoming glabrate below, the margin irregular, commonly undulate; inflorescence terminal, often stout, the basal ocreae to 7 mm. long, membranaceous, the peduncle to 1.5 cm. long, the rachis minutely and often densely puberulent, 10–18 cm. long on mature shoots, to 45 cm. long on adventitious shoots, the bracts broadly ovate, about 1 mm. long, puberulent, the ocreolae membranaceous spreading, 1 mm. long, minutely puberulent or glabrate; staminate flowers 2–4 at each locus, the pistillate flowers 1–3 at each locus, the pedicels 2–3 mm. long, the hypanthium 0.6–1 mm. long, the perianth lobes broadly orbicular, 1.5 mm. long, 2 mm. wide, puberulent, the fertile stamens 2.5 mm. long, the sterile stamens rudimentary 0.5–1 mm. long, the fertile pistil glabrous or rarely slightly puberulent, on the ovary, the sterile pistils glabrous, rudimentary, 0.5–1.5 mm. long; fruit globose to ovoid, 5–6 mm. long and 4.5 mm. in diameter, the fruiting perianth imbricate at the apex, not coronate, the fruiting hypanthium with conspicuous vascular bundles; achene subglobose, dark brown, shining, slightly triradiate at the apex, the fruiting pedicels puberulent, 3–4 mm. long.

DISTRIBUTION: Dominican Republic, Puerto Rico, Virgin Islands and the Lesser Antilles south to St. Lucia and Barbados.

Barbuda: *Ponthieu s.n.* (FM). **Antigua:** Carrs Gut, *Box 301* (US), 1496 (A, US, ISOTYPES of *C. antiguensis*); Macarthy Hills, *Box 1495* (BM, US); Wallings Area, *J. Beard 283* (A, MO), *Howard 11984* (GH); Blubber Valley, *Howard 11863* (GH), without location, *Wullschlaegel 486* (M). **Montserrat:** Cudjoe Head, *Shafer 457* (FM, NY, US); Harris' Lookout, *Howard 11873* (GH). **Nevis:** Ward's Mountain, *Howard 11933* (GH). **Guadeloupe:** Pigeon, *Duss 3379* (US); Désirade, *Stehlé 195* (GH, NY); Deshaies, *Stehlé 2018* (US); Jarry, *Questel 602* (US); Vieux Fort, *Howard 11847* (GH), *11849* (GH); without location, *Duss 1743* (NY), *2193* (FM, GH, MO, NY). **Dominica:** Calibishie, *W.H. & B.T. Hodge 3142* (GH); Pointe Ronde to Milton Estate, *W.H. & B.T. Hodge 2668* (GH); Pointe Baptiste near Calibishie, *W.H. & B.T. Hodge 3499* (GH). **Martinique:** Presqu'île de la Caravelle, *Egler 39–252* (NY), *Duss 1743* (NY), *Howard 11728* (GH), *11729* (NY). **St. Lucia:** Between Le Toc and Cul de Sac Bay, *Howard 11371* (GH); Vieux Fort, *Howard 11475* (GH). **Barbados:** Turner's Hall Woods, *Eggers 7158* (A).

The growth forms of *Coccoloba pubescens* have been discussed in earlier papers (Jour. Arnold Arb. 38: 229–231. 1957, 39: 37–39, 44–46. 1958). Immature forms with wand-like branches and very large leaves are the most common habit found in the Lesser Antilles. Beard illustrates such growth forms in his publication "Vegetation of the Windward and Leeward Islands" (Oxford Forestry Memoir 21: f. 32. 1949). A few isolated mature plants with the smaller leaf type were seen and collected on St. Lucia (*Howard 11475*), Guadeloupe (*Howard 11849*) and Martinique (*Howard 11729*). The variation in the texture, size and pubescence of the leaves within the populations studied in the field will include that described by Sandwith for his species *C. antiguensis*. I have previously placed that species in the synonymy of *C. pubescens* (Jour. Arnold Arb. 38: 231. 1957).

Coccoloba striata Benth. Hooker Lond. Jour. Bot. 4: 626. 1845.

Coccoloba guianensis Griseb. Fl. Brit. W. I. 163. 1859, not Meisner.

Coccoloba grisebachiana Lindau, Engl. Bot. Jahrb. 13: 195. 1890.

Coccoloba pittieri R. Knuth ex Pittier, Man. Pl. Usuales Venez. 355. 1926.

Tree with scrambling branches; branches hollow, striate, glabrous; ocreae membranaceous above, coriaceous and persistent below, strongly ribbed; petioles attached above the base, strongly grooved above, 1.5–2 cm. long, glabrous; blades ovate to ovate-elliptic, 9×5.5 to 14×8 cm. long and broad, chartaceous, usually turning dark on drying, the apex shortly and obtusely acuminate, the base rounded to cordate or slightly cordate-auriculate, the midrib and primary veins almost immersed above and only slightly prominent below, the primary nerves 6–8 pairs, arcuate and anastomosing near the margin, the ultimate venation densely reticulate; leaves of scrambling shoots broadly ovate to 23 cm. long and 18 cm. broad, on petioles 3 cm. long; inflorescence to 27 cm. long, the rachis thin and glabrous or slightly puberulent, the flowering nodules widely separated in the pistillate plants and less conspicuously so in the staminate plants, the peduncle about 1 cm. long, the bracts ovate to triangular generally 1 mm. long, the ocreolae flaring, scarcely as long as the bracts, the pedicels equalling the ocreolae in the staminate flower; staminate flowers generally 2–4 per nodule, the hypanthium 0.75 mm. long, the perianth lobes ovate to oblong, 0.5 mm. long, the functional stamens with filaments 1 mm. long; pistillate flowers not seen; fruiting pedicels 2–2.5 mm. long, the ripe achenes red, ovoid, about 9 mm. long and 6 mm. in diameter, the apex acuminate, the lobes inconspicuous, the fruit slightly stalked at the base, obscurely 3-angled.

British Guiana: Without specific location, *Richard Schomburgk 1265* (B). **Trinidad:** Mount Tocuche, *Crueger* (TRIN 776-ISOTYPE of *C. grisebachiana*), *Baker* (TRIN 14804), *Freeman* (TRIN 9045), *Britton, Hazen and Mendelson 1262* (GH, NY). **Venezuela:** Carababo, Guaremales, *Pittier 8880* (A, GH, ISOTYPES of *C. pittieri*); Carruao, *Pittier 11847* (A).

This species is distinctive among the other species of *Coccoloba* reported from Trinidad on the basis of the hollow scrambling branches, the attachment of the petioles above the distinctive base of the ocrea and by the widely separated flowering nodules on the inflorescence rachis of the pistillate plants. The extremely fine reticulate pattern of the ultimate venation of the leaves is also characteristic, although this expression is not always seen in the herbarium collections.

One sheet of *Pittier 8880* in the Gray Herbarium collections cited above probably represents an adventitious shoot. A short piece of the stem 9 cm. long contains one node. The stem is hollow and the ocrea extends 5.5 cm. above the apex of the petiole scar and 1.5 cm. from this point down the stem. The ocrea is coriaceous, appressed and deeply bifid. The leaf on the same herbarium sheet is not attached but is oblong in shape and 40 cm. long and 17 cm. broad. The margin is obviously undulate when fresh. Unless this is a mixed collection, which does not seem likely, the dissim-

ilarity of the leaves of fertile and adventitious shoots is as large in this species as in other species of *Coccoloba*.

The material cited above from Trinidad is all from pistillate plants in fruiting condition or with old inflorescence axes. The types of *Coccoloba striata* and *C. pittieri* are staminate plants. There is no question in my mind that these are all conspecific, although I have not seen this species in the field.

Coccoloba paraensis Meisner, based on Spruce and Martius' material from Para and Amazonas, and *C. glaziovii* Lindau, based on a Glaziou specimen collected from Rio de Janeiro, probably represent the same species and should be assigned to synonymy here. Regrettably, I have insufficient material either to include or exclude these species with certainty at the present time.

Coccoloba swartzii Meisner, DC. Prodr. 14: 159. 1856; Lindau, Engl. Bot. Jahrb. 13: 157. 1890; Howard, Jour. Arnold Arb. 30: 420. 1949, 37: 317-339. 1956.

Coccoloba swartzii var. (?) *portoricensis* Meisner, DC. Prodr. 14: 160. 1856.

Coccoloba barbadensis Lindau, Engl. Bot. Jahrb. 13: 148. 1890; Duss, Ann. Inst. Col. Marseille 3: 166. 1897, not Jacquin.

Coccoloba diversifolia Lindau, Symb. Antil. 1: 223. 1899; Griseb. Fl. Brit. W.I. 163. 1859, and most recent authors, not Jacquin.

Trees 8 to 20 m. tall; branches terete, the youngest puberulent, becoming glabrate, the nodes slightly tumid; ocreae 10-12 mm. long, the basal portion 3-5 mm. long, coriaceous, persistent, the upper portion membranaceous and deciduous, puberulent to glabrate; leaves of normal shoots with petioles 10-18 mm. long, puberulent to glabrate, the blades ovate to elliptic, 2.2 × 1.3, 7 × 5, 11 × 9, 15 × 7.5 cm. long and broad, coriaceous, usually turning black on drying, glabrous, having pit-like depressions on the upper surface and small glands on the lower surface, the apex acute, often rounded, the base narrowed, rounded or slightly cordate and usually oblique, the margin entire; midrib and veins inconspicuous or flat above, prominent below, the primary veins 6 or 7 pairs, arcuate, anastomosing, the secondary venation conspicuous, reticulate; leaves of adventitious shoots with petioles 1.5-2.5 cm. long, the blades generally ovate to lanceolate 23 × 8.5, 45 × 18.5, to 70 × 25 cm. long and broad, the apex acute to acuminate, the base rounded; inflorescence terminal 10-15 cm. long, the rachis glabrous or with glandular exudate, rarely papillose; staminate flowers in clusters of 3-5 flowers at each node, tightly surrounded by membranaceous ocreolae which form a truncate cylinder after the flowers have fallen, the pistillate flowers borne singly at each node, the bracts ovate 0.5 mm. long, the ocreolae 1.15 mm. long, membranaceous, the pedicels shorter than the ocreolae; hypanthium 0.5 mm. long, the perianth lobes 1-1.5 mm. long, the fertile stamens 1-1.5 mm. long, the sterile stamens rudimentary, 0.5 mm. long; fruit ovoid 8-10 mm. long, 6 mm. diameter, the perianth lobes 1-1.5 mm. long and coronate in fruit; achene dark brown.

DISTRIBUTION: Jamaica, the Bahamas, Dominican Republic, Puerto Rico, St. Croix, St. Jan, Virgin Gorda, St. Thomas, Saba, St. Kitts, Montserrat, Nevis, Antigua, Guadeloupe, Dominica, Martinique, St. Lucia and Barbados.

Antigua: Pearl Hill, *Box 975* (US). **St. Kitts:** Mt. Misery, *R.A. & E.S. Howard 11938* (GH). **Nevis:** *R.A. Howard 11921* (GH). **Montserrat:** Central Hills, *R.A. & E.S. Howard 11868* (GH), *11866* (GH), *11871* (GH), *11872* (GH); Gage's Upper Soufriere, *R.A. & E.S. Howard 11882* (GH); Gardu Gut, *Shafer 323* (F, NY, US), *615* (F, NY, US). **Guadeloupe:** Bois de Gombeyre, *Duss 3251* (F, GH, NY, US); Bouillante to Pointe Noire, *R.A. & E.S. Howard 11843* (GH). **Dominica:** Antilles near Marigot, *R.A. & E.S. Howard 11754* (GH); Salybia, *W.H. Hodge 3404* (GH); South Children Estate, *W.H. & B.T. Hodge 1583* (GH). **Martinique:** Casa Pilote, *Hahn 1187* (F, GH, US), *R.A. & E.S. Howard 11712* (GH); Diamant, *Duss 37, 248* (NY); Mt. Pelee, *Duss s.n.* (NY); Montagnes des Trois Flotz, *Hahn 629* (F, GH); Presqu'île de la Caravalle, *R.A. & E.S. Howard 11727* (GH), *Egler 39-230* (NY); Trois Islets, *R.A. & E.S. Howard 11731* (GH). **St. Lucia:** Castries-Dennery Road, *R.A. & E.S. Howard 11335* (GH), *11329* (GH), *11355* (GH); Gros Piton, *R.A. & E.S. Howard 11506* (GH); Le Toc to Cul de Sac Bay, *R.A. & E.S. Howard 11377* (GH); Vieux Fort, *R.A. & E.S. Howard 11404* (GH). **Barbados:** Turners Hall Wood, *Eggers 7161* (US).

Coccoloba swartzii forma *pubescens* Howard, Jour. Arnold Arb. 30: 420. 1949.

Similar to the species, but the young shoots, petioles, the lower end of the upper leaf surface, especially the midrib, the ocrea and the inflorescence rachis, at least at the base, puberulent to pilose pubescent.

Antigua: Blubber Valley, *Box 1411* (US-HOLOTYPE), *R.A. & E.S. Howard 11860* (GH), *11985* (GH), *11986* (GH); Carr's Ghaut, *R.A. & E.S. Howard 11994* (GH); Orange Valley, *Box 1184* (GH, US); Pelican Bay area, *R.A. & E.S. Howard 11990* (GH); Sugar Loaf Mt., *Box 1543, 1544* (US), *A.C. Smith 10489* (A). **Barbuda:** Codrington Village, *Fairchild 3830* (A, US); Martello Tower, *J.D. Beard 372* (A, MO); without location, *Box 602* (US). **Guadeloupe:** *De Ponthieu 86* (FM).

Coccoloba uvifera L. Syst. Nat. ed. 10. 1007. 1759.

Polygonum uvifera L. Sp. Pl. 365. 1753.

Guaibara uvifera House, Amer. Midl. Nat. 8: 64. 1922.

Tree of strand areas, 2-17 m. tall, branches terete, stout, papillose to pilose, the nodes not tumid; ocreae rigid, coriaceous at the base, membranaceous at the apex, 3-8 mm. long, papillose to pilose; leaves of normal shoots with petioles stout, 7-10 mm. long, papillose to pilose, the blades orbicular to reniform, 6 × 8, 11 × 13, 13 × 18 cm. long and broad, thick and fleshy when fresh, coriaceous when dry, glabrous and minutely punctate on both surfaces, the apex rounded truncate or emarginate, the base rounded to broadly cordate one lobe often extending around the petiole; midrib and primary veins prominent on both surfaces, frequently brightly colored when fresh, the primary veins 3-5 pairs, usually straight, bifurcate

and weakly anastomosing near the margin, commonly barbate in the axils of the basal veins, the secondary venation minutely reticulate or obscure; leaves of adventitious shoots usually variable in size and shape, commonly obovate; inflorescence stout, 15–30 cm. long, the rachis puberulent; staminate flowers in clusters of 1–7, the pistillate flowers solitary at each locus, the bracts ovate, 1–1.5 mm. long, 2 mm. broad, puberulent, the ocreolae membranaceous, 1 mm. long, puberulent, the flowering pedicels 1–2 mm. long, the perianth yellow-white or greenish, the hypanthium 2–3 mm. long, the perianth lobes 4 mm. long, 3–4 mm. wide, the fertile stamens to 4 mm. long; fruiting pedicels 3–4 mm. long; fruit obpyriform, 1.2–2 cm. long, 8–10 mm. diameter, narrowed at the base, rounded-truncate at the apex, the perianth lobes appressed against the apex of the achene, the perianth rose-purple when mature, the achene black.

DISTRIBUTION: Throughout tropical America along the coasts.

Antigua: Carr's Ghaut, *R.A. & E.S. Howard 11992* (GH); without location, *Box 1434* (A, US). **St. Barts:** *Euphrasen s.n.* (s), *Forsström s.n.* (s), *Questel 82* (NY). **Montserrat.** Harris' Lookout, *Howard 11874* (GH). **St. Kitts:** *Britton & Cowell 247* (NY), *Sargent s.n.* (A). **Guadeloupe:** St. Francois, *Howard 11787* (GH); without location *Duss 2183* (US). **Dominica:** Carib Reserve, *W.H. & B.T. Hodge 3316* (GH); Cabrites, *Howard 11750* (GH); Hatton Garden, *W.H. & B.T. Hodge 2957* (GH); Pointe Ronde, *W.H. & B.T. Hodge 2686* (GH); Scot's Head, *W.H. & B.T. Hodge 1605* (GH). **Martinique:** Casa Pilota, *Howard 11720* (GH); Presqu'île de la Caravalle, *Howard 11726* (GH); Salinas Pie Beach, *Egler 39–19* (NY); without location *Belanger s.n.* (B), *Duss 1742* (US), *Sieber 103* (MO, US). **St. Vincent:** Kingshill, *Howard 11125* (GH). **Grenadines:** Bequia, *Dalton for H.H. Smith B-128* (GH); Mayero, *Howard 11041* (GH), *11042* (GH); Petit St. Vincent, *Howard 10912* (GH); Kick 'em Jenny, *Howard 10782* (GH). **Grenada:** Grande Anse, *Broadway s.n.* (FM, GH), *J.S. Beard 203* (A). **Barbados:** Christ Church, *Dash 129* (FM); St. Philip, *Bovell 129* (US); without location, *Curran* (FM, MO), *Eggers 7347* (A). **Trinidad:** Galera Point, *Broadway s.n.* (A); Monos Island, *Williams* (TRIN). **Tobago:** Buccoo Bay, *Elmore V-4* (FM); Crown Lands, Palo Saco, *Russell* (TRIN 13071); Farm Road, *Williams* (TRIN 11143); Lower Scarborough, *Broadway 3617* (FM, s); Mt. St. Georges, *Howard 10480* (GH); Speyside, *Turley* (TRIN 15244).

Coccoloba venosa L. Syst. Nat. ed. 10, 1007. 1759; Fawcett & Rendle, Jour. Bot. 51: 123. 1913.

Uvifera arbor americana, fructu aromatico punctatus, Pluk. Alm. 394. t. 237, fig. 4. 1696, as to leaf only.

Coccoloba punctata L. Sp. Pl. ed. 2, 523. 1762.

Coccoloba nivea Jacq. Hist. Stirp. Amer. 115, pl. 78. 1763; Enum. Pl. 19. 1762.

Coccoloba excoriata Duss, Ann. Inst. Col. Marseille 3: 168. 1897, not L.

Guaibara venosa House, Am. Midl. Nat. 8: 64. 1922 as *Guaibara*.

Trees to 15 m. tall; branches terete, glabrous, the nodes not tumid; ocreae membranaceous, deeply cleft, acuminate on one side, or truncate, to 2 cm. long; glabrous or with flattened glands; leaves of normal shoots with petioles 5–10 mm. long, glabrous, the blades oblong-lanceolate to elliptic, 8 × 4, 10 × 4.5, 16.5 × 6.5, 21 × 9, 27 × 10.5 cm. long and

broad, membranaceous, glabrous except for clusters of hairs in the axils of the veins, sparsely glandular below, the apex short-acuminate, the base narrowed and slightly cordate or cuneate or obtuse; midrib and primary veins slightly prominent on both surfaces, the primary veins 8–13 pairs, straight or arcuate, bifurcate and anastomosing at the margins; leaves of the adventitious shoots about the same size, the internodes much elongate and the ocreae to 4 cm. long; inflorescence terminal or terminal on short lateral branches, the rachis puberulent, angular; staminate flowers in clusters of 2–5, the pistillate flowers solitary, the bracts lanceolate-ovate, to 1.5 mm. long, black, puberulent to pilose or commonly with a fringe of hairs at the apex; ocreolae membranaceous, enlarging with the expanding bud, each flower with an ocreola, to 2 mm. long, the flowering pedicels 1–2 mm. long, glabrous; hypanthium less than 0.5 mm. long, the perianth lobes broadly ovate, 1.5–2 mm. long and broad, slightly unequal, the fertile stamens to 1 mm. long; fruiting pedicels 1.5–2.5 mm. long, the perianth lobes fleshy, white or pink, enclosing the black achene, the hypanthium scarcely evident in the fruit, the fruit 3–4 mm. long and broad, the fruit broadly ovoid.

DISTRIBUTION: Cuba (introduced), Hispaniola, Puerto Rico, Jamaica (?), Virgin Islands, Lesser Antilles and Trinidad.

Antigua: Galley Bay, *Box 1081* (US); Morris, *J.S. Beard 351* (A, MO); Wallings, *Howard 11989* (GH), without location, *Fairchild s.n.* (US). **St. Martin:** *Forsström s.n.* (S), *Boldingh 2993B* (NY). **St. Barts:** *Forsström s.n.* (NY, S), *Le Gallo 2371* (A). **Montserrat:** Harris' Lookout, *Howard 11875* (GH). **Tortola:** *Schafer 1125* (US). **Guadeloupe:** Bouillante to Pointe Noire, *Howard 11842* (A); Gourbeyre, *Duss 3250* (FM, NY, US); Riviere, *Stehlé, Quentin & Bena 5313* (US); Les Saintes, *Questel 1763* (US). **Dominica:** Roseau to Canefield, *Hodge 443* (GH, NY, US). **Martinique:** Carbet, *Duss 1744* (NY); Casa Pilota, *Hahn 967* (G, US), *1182* (S), *Howard 11714* (GH). **St. Lucia:** Soufriere, *Howard 11580* (GH). **Grenadines:** Kick 'em Jenny, *Howard 10792* (GH); Isle of Ronde, *Howard 10713* (GH), *10717* (GH). **Grenada:** *Broadway s.n.* (MO, NY, US). **Barbados:** Dodd's Botanical Station, *Waby 131* (FM); Turners Hall Woods, *Gooding 594* (NY), *Dash 262* (NY). **Trinidad:** Castara, *Sandwith 1831* (NY); Cat's Hill Reserve, *Swabey 12535* (TRIN); Galera Point, *Broadway 2788* (BR, FM, GH, MO, NY, TRIN); Guanapo, *Dannouse s.n.* (TRIN); Quinam Reserve, *Williams 12015* (NY, TRIN); Southwest Reserve, *Marshall 12404* (TRIN), *Swabey 12271* (TRIN); Southern Watershed Reserve, *Russell 12261* (TRIN); Toco, *Freeman & Williams 11768* (NY, TRIN). **Tobago:** Mason Hall, *Broadway 4160* (A, FM, GH, MO, NY, S, TRIN), *Howard 10470* (GH); Point opposite Melville Island, *Freeman & Williams 11422* (TRIN). **Little Tobago:** *Swabey 12959* (TRIN).